Detailed Description of the Invention

The electrical contact pins are preferably cylindrically configured and have a proximal male end ~~ofe~~ of a solid diameter ending with a spherical nose. The distal female end of the pin is preferably tubular shaped and slotted, with the slots forming at least three cantilever beams, more preferably six cantilever beams. By collapsing the beams evenly towards the radial center of the bore of tubes, these beams, in effect, become individual springs offering a sphincter tension about a male cylinder with a spherical nose as a male cylinder penetrates the tube. At the extreme distal end of the slotted tubes and on the outer periphery of the slotted tubes are preferably configured raised angular crests. At the approximate center between the proximal cylinder and the distal tube is preferably a raised cylindrical collar. This cylindrical collar acts as a retention member which prohibits the removal of the electrical contacts in any axial or radial direction when it is assembled within the dielectric members of the connector of the invention. These electrical contacts are usually constructed from a copper alloy with spring-like qualities which may be introduced by heat-treat processing. A gold or silver plating will prevent oxidation on the contact pin.

The connector also comprises a multi-piece dielectric housing. It preferably is comprise of at least three separate pieces, which are preferably constructed from a glass-filled thermoplastic material. The glass fiber enhances the strength of the material while the thermoplastic material is selected for its dielectric properties. Additional dielectric members used to make the connector, such as gaskets, may be

part of the pin and has a bearing surface 15 held perpendicular to the central axis of the pin. These surfaces may be lightly angled as a method of increasing the bearing surface. Each pin has a cylindrically shaped proximal end 16 that extends from the annular ring 13 and terminates as a self-guiding spherical radius 17. This proximal end comprising the cylinder 16 and self-guiding spherical radius 17 constitutes the male portion of contact pin. These cylinders 16 extend beyond the surface 12 of the connector adapter 10. ~~the~~ The distal end of the contact pins ~~have~~ are tubular in shape having a hole or bore 19. This bore is of a diameter and depth that readily accepts the full length of the pin contacts on the connector to which is will be attached, such as an aircraft ground power connector. The cylinder 18 has slots 20. There may be several individual beam members 21. The beam members are preferably collapsed towards the internal radial and longitudinal center point 22. These beam members 21 may be sprung open by the entry of an equivalent size cylinder 16, but will retract to the collapsed position upon withdrawal of cylinder 16. At the bore 19 entry is preferably a chamfer 23 for easy entry in the event of a slight misalignment of a similar cylinder 16. On the outside diameter of the tubular end of the contact pins and at the ends of each beam member 21 is a raised crown or wedge 24.

The contact pins are held securely within the connector. The annular ring 13 is layered between the body retainer block 4 and pin retainer block 3 and axial movement is prevented in both a forward and rearward direction. Holes 25 are strategically configured within the socket retainer block 6, gasket 5, body retainer block 4 and pin

retainer block 3. These holes 25 closely approximate the outer configuration of the male/female electrical contact pins. These crest or crowns 24 interface and nest within a conical hole 26 that is a portion of hole ~~26~~ 25 within the socket retainer block 6. This conical hole 26 decreases in size to a cylindrical hole 27 that accepts a cylinder or pin size equivalent to cylinder 16. A lead in chamfer 28 is configured from the socket retainer block 6 down to the cylindrical hole 27 in the event of a mis-aligned pin on the aircraft fixed connector.

The connector is loosely assembled together with screws 7 passing through holes 25 configured within the pin retainer block 3, body retainer block 4, and gasket laminate 5 and are loosely screwed into permanently affixed metal threaded inserts 8.

The connector may be assembled such that the front face 14 of the socket retainer block 6 is pushed down over the electrical contact pins on the aircraft fixed connector. Once pins on the aircraft fixed connector fully enter the bores 19 within the female ends of the pins, the screws are fully tightened. As screws 7 are tightened, the conical holes 26 ~~within the 26~~ within the holes 25 of the socket retainer block 6 are forced over the angles of the crest 24 of the individual beams members 21 at the distal end of the contact pins. This action forces a sphincter reaction of the individual beam members 21 around the aircraft fixed connector pins. Subsequently, the ground supply free connector (ground power plug) is coupled onto the male/female contact pins 29. The described sphincter force is greater than the force required to uncouple a ground power plug from the connector 10.